

FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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EDITORIAL COMMENT.

The Effect of Aircraft on Military Operations.

The frequency with which tributes are forthcoming to the great part aircraft is playing in the European war is more and more encouraging to those who have for so long foretold the all-vital necessity of Great Britain being supreme in the air as she is on the sea. There has hardly been an official despatch from the front that has not alluded to the valuable service which is being rendered by the Royal Flying Corps, the most complimentary, yet well-merited, reference to its work having been that of Field-Marshal Sir John French himself. Further striking evidence of the power of the fourth arm is the amount of space devoted to this side of the operations by "Eye-Witness" in his report issued on Monday last. This practically amounts to a dissertation on the qualifications necessary in members of the Corps for tactical and strategical reconnaissance work.

We publish the full text, as given by "Eye-Witness," elsewhere in the present issue, but we cannot refrain, however, from giving special prominence to his statement that "It is a truism that the introduction of aviation has had a profound effect upon the whole character of military operations. And in no way has it

modified war more than by greatly eliminating the element of surprise, for, so long as the weather permits of the employment of aerial reconnaissance, it is impossible for any great concentration or movement of troops to be carried out by day within a certain radius without being discovered."

The Reorganisation of the Royal Flying Corps.

Having in mind "Eye-Witness's" tribute to its work, referred to above, the announcement during the week of the reorganisation of the Military Wing of the R.F.C. is not without its significance, showing, as it does, that our military authorities not only appreciate its work to the full, but are preparing for further developments of the new arm. It will be seen from the new constitution of the corps that the appointment of Officer Commanding the R.F.C. (Military Wing) is abolished, and that in future it will be organised in Wings, each under a separate commanding officer, and consisting of two, three, or, in special cases, four squadrons. An additional Wing Commander, to be known as the Administrative Wing Commander, will command the R.F.C. dépôt, and be the officer in charge of records. In war the reserve aeroplane squadrons and the aircraft park at home will also be under his command.

The Army Order notifying the reorganisation gives full particulars of the changes that are being made, and specifies the duties of Wing Commanders, Adjutants, Equipment Officers, and Administrative Wing Commander, and also outlines the procedure as to promotions. It also states that *personnel* will on enlistment be sent to the R.F.C. dépôt for training, not only in the ordinary duties of a soldier, but also in the technical duties as air-mechanics in the technical section of the Corps dépôt, from which they will be drafted to Wings according to requirements.

The order bears evidence that the expanding work of the R.F.C. is being carefully studied by the authorities, and this development of military aviation in Great Britain will tend to further broaden the scope of the Corps.

Aeroplane Postal Services.

Several propositions have been made in the past in the United States to establish aerial posts in suitable districts, all of which have been turned down by the authorities. During the past week information is to hand of another proposal put forward by the U.S. Second Postmaster-General to supplement the postal service in

that country by a corps of some 2,000 well-trained aviators, which is likely to give a useful impetus to the question of utilising aircraft for other than military purposes. Notwithstanding the great development of both the road and railway systems in the United States that has been going on for many years, investigation indicates that there are still very many districts in the country where the transportation of the mails could not only be improved and expedited by an aeroplane service, but also cheapened, in comparison with the slow and unsatisfactory means of conveyance at present employed.

This is, of course, as we have stated, not the first time that the use of aeroplanes in connection with mail transportation work in the U.S. has been proposed. Although it is the first promise of a really material advance in this direction, in this country we had a few years ago the aerial post week worked from Hendon, while French workers in the field of aviation have also experimentally demonstrated the possibilities in the way of maintaining postal communication by means of aeroplanes in Morocco and in the scattered outposts of the great Sahara Desert.

While we do not suggest that aeroplanes should at present be used for mail transportation work in countries like our own where the network of railways is not only fairly complete, but, where necessary, is supplemented—and this on an ever-increasing scale—by motor road vehicles, yet there is no doubt that there are many places in the world which are as yet not so fully developed in these directions, where an aerial postal service could advantageously be introduced.

The aviation movement has made wonderful strides during the past few years; not only have the machines and their engines been greatly improved as regards design and construction, but much has been learned by builders and pilots that should enable any projected aerial postal service to be carried on with a degree of reliability

that was not possible when the experiments we have already alluded to were taken in hand, so that on this score there would seem to be no reason why the American proposal should not be put into practice.

It is not disguised by those responsible for the American scheme that they have as much an eye to the valuable asset to the country a corps of 2,000 trained aviators would prove in time of war as to the service it would render in improving the postal service. The great part aircraft is playing in the European war is not being noted merely by the belligerents; it is being closely studied by neutral countries, which are realising that a well-equipped military flying corps has become a prime necessity of all modern armies. It is not surprising, therefore, that one of the strongest arguments that have been advanced in the United States in favour of the formation of a corps of what are familiarly referred to as aerial postmen, is the valuable reserve which it would initiate from which a large number of expert military flying officers could at once be drawn should war at any time be threatened, the idea being that, while performing their normal duties in the carrying of the mails, a certain amount of time should be devoted by the pilots to making themselves proficient in scouting and reconnaissance work.

It is to be hoped, therefore, that the U.S. Second Postmaster-General's proposal will be given a trial. The scheme, as it stands—that of establishing a corps of 2,000 trained aviators for postal work—may perhaps be regarded as a too ambitious one for immediate realisation; there is, however, no reason why the idea should not be tried on a restricted scale, when, if it proved successful, there would be no difficulty in expanding it to meet the requirements of the postal service, and at the same time bringing its strength up to that considered requisite from a military point of view. It would certainly give a further magnificent impetus to the great art which FLIGHT has so much at heart.

THE BRITISH AIR SERVICES.

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

Royal Naval Air Service.

The following was announced by the Admiralty on the 14th inst. :—

Temporary Surgeons: A. L. Sutcliffe to the "Pembroke III," for Royal Naval Air Service; K. Wolferston to the "Pembroke III," for Eastchurch Air Station, *vice* McCutcheon; and F. J. Humphreys, to the "Pembroke III," for Royal Naval Air Service. Jan. 13th.

The following was announced by the Admiralty on the 16th inst. :—
C.P.O. Mechanics: G. T. Cain and H. H. Square, both promoted to the rank of Probationary Flight Sub-Lieutenants, and appointed to the "Pembroke III," for R.N. Air Service. To date Jan. 14th.

The following was announced by the Admiralty on the 18th inst. :—
Col. J. R. Oldfield, R.M.L.I. (Reserve list), to the "Pembroke," additional, for special service with the Royal Naval Air Service. To date Dec. 23rd.

Royal Flying Corps (Military Wing).

The following appeared in a supplement to the *London Gazette* issued on the 14th inst. :—

The undermentioned non-commissioned officer to be Second Lieutenant for service in the field :—

The Loyal North Lancashire Regiment.—Sergt. Thomas Fawdry, from Royal Flying Corps. Dated Dec. 17th, 1914.

The following appeared in a supplement to the *London Gazette* issued on the 16th inst. :—

The undermentioned appointments are made :—

Commands and Staff.—General Staff Officer, First Grade.—Brevet Major (temporary Lieut.-Col.) Frederick H. Sykes, 15th (the King's) Hussars (Royal Flying Corps, Military Wing), and to retain his temporary rank. Dated Dec. 21st, 1914.

Lieut. C. S. Burnett, Reserve of Officers, to be Flying Officer. Dated Dec. 4th, 1914.

Special Reserve. Supplementary to Regular Corps.—Robert Orme to be Second Lieutenant (on probation). Dated Jan. 8th, 1915.

The following appeared in a supplement to the *London Gazette* issued on the 18th inst. :—

His Majesty the King has been graciously pleased to promote by brevet the undermentioned officers :—

To be Lieutenant-Colonels: Major (temporary Lieut.-Col.) Hugh Montague Trenchard, C.B., D.S.O., Royal Scots Fusiliers, Wing Commander, Military Wing Royal Flying Corps, and Major (temporary Lieut.-Col.) William Sefton Brancker, Royal Artillery, Assistant Director of Military Aeronautics, War Office.

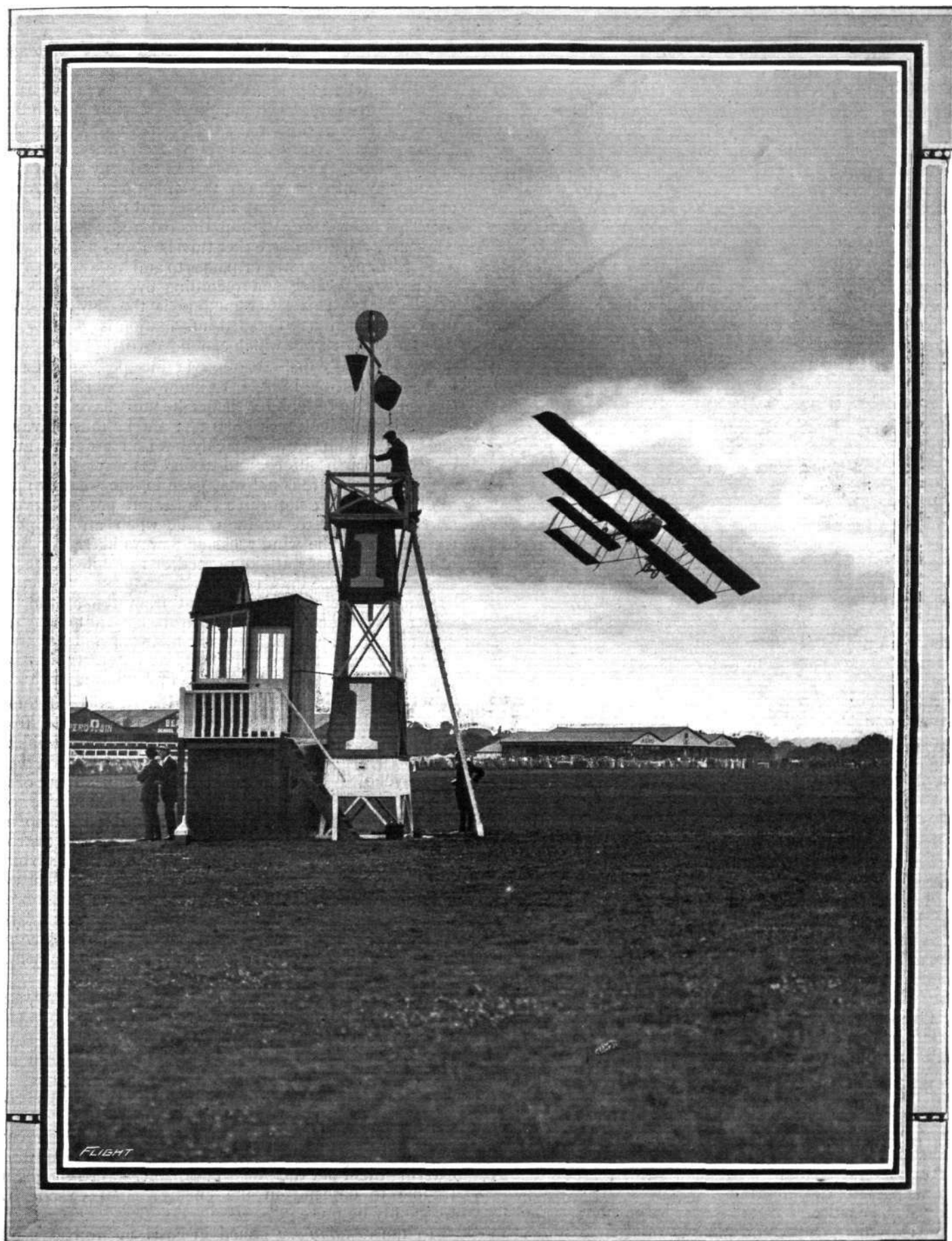
The undermentioned appointment is made :—

Second Lieut. Hugh C. Tower, Special Reserve, to be Flying Officer. Dated Oct. 15th, 1914.

Special Reserve. Supplementary to Regular Corps.—The undermentioned Second Lieutenants (on probation) are confirmed in their rank: Clifford A. Hooper and Hugh C. Tower. Leo Francis Page to be Second Lieutenant (on probation). Dated Jan. 11th, 1915.

The following appeared in the *London Gazette* issued on the 19th inst. :—

Second Lieut. (on probation) John T. C. Moore-Brabazon is confirmed in his rank. To be Second Lieutenants (on probation), Jan. 11th, 1915: Herbert P. S. Clogstoun, Maurice L. Gardner.



"Flight" Copyright.

IN THE SPORTING AND RACE DAYS AT HENDON DURING LAST YEAR.—Mr. Pierre Verrier rounding a pylon during a heat.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

In the despatch dated January 12th from the "Eyewitness" with the British General Headquarters in France, issued by the Press Bureau on the 14th inst., there were the following references to the work of aircraft:—

"Along the rest of the line (on January 10th) the German artillery was more active than it has been for some days. Otherwise nothing of interest occurred, except a minor success gained in the centre by our anti-aircraft guns, which scored a hit upon a German aeroplane and forced it to return in haste towards its own lines."

"During the last few days there has been a considerable amount of wind, especially at high altitudes. This has been felt by the aviators, but has not prevented reconnaissance. On one day it was blowing so hard that an observer, engaged in photographing a certain area, found himself actually travelling backwards relatively to the ground at the rate of ten miles an hour, though he was on a very fast machine, going ahead at full speed through the air."

In the despatch from "Eyewitness" dated January 16th, and issued on the 18th, there were the following references:—

"Our guns have been successful in demolishing the important bridge at Frelinghien below Armentières. Fire was directed upon it some time ago, and, though it was reported to have been damaged, doubts existed as to the exact extent of the harm done. It is now stated by our aviators to be completely ruined."

"It is a truism to say that the introduction of aviation has had a profound effect upon the whole character of military operations. And in no way has it modified war more than by greatly eliminating the element of surprise, for so long as the weather permits of the employment of aerial reconnaissance, it is impossible for any great concentration or movement of troops to be carried out by day within a certain radius without being discovered."

"Especially in the form of warfare in which both sides are at present engaged is the former function of cavalry as regards reconnaissance usurped by the flying corps."

"There are, generally speaking, two forms of reconnaissance, whether executed by aviators or cavalry—tactical and strategical. It is difficult to draw a hard and fast line between them, or to define exactly where one begins and the other ends; but the former may be said to be undertaken exclusively for the purpose of ascertaining the strength and dispositions of the enemy in a strictly limited area along a battle front, by locating and examining his trenches, gun emplacements, headquarters, reserves, supply parks, and rail-heads. Its sphere ceases at a comparatively short distance from the front of the opposing forces."

"All that is going on in the area far behind the enemy's line comes within the sphere of strategical reconnaissance, which is undertaken with the object of obtaining information about the enemy in a particular part of the theatre of war, and so enabling a commander to form an idea as to his opponent's designs."

"While tactical reconnaissance is chiefly of value to corps or divisional commanders, to enable them to know what is in their immediate front and to make their local dispositions accordingly, the higher leading and direction of the large masses—in a word, the plan of campaign framed by a commander-in-chief and his

General Staff—depend upon the results of strategical reconnaissance."

"The intelligence upon which such plans will be based is that referring to the amount of transport and rolling stock on roads and railways, the strength of columns of troops, the size and situation of bivouacs, parks and supply depôts, second lines of defence, and any other facts which may afford a clue to the strength and disposition or movements of an enemy's masses and to his intentions."

"To gather information of this nature by aerial reconnaissance, the observer either travels above a previously-selected line of country or passes to and fro over a certain definite area, noting and recording everything of value that he sees. This latter method is the slower, and is used only when very detailed information is required."

"This is not work which can be carried out by everyone. The really first-rate observer must possess extensive military knowledge in order to know what objects to look for, and where to look for them; he must have very good eyesight in order to pick them up; and he must have the knack of reading a map quickly both in order to mark correctly their positions, and to find his way."

"To reconnoitre is not easy even in fine weather; but in driving rain or snow, in a temperature perhaps several degrees below zero, or in a gale, when an aeroplane travelling with the wind rocks and sways like a ship in a heavy sea, and may attain a speed of 150 miles an hour, the difficulties are immense."

"In these circumstances, and from the altitude at which it is necessary to fly in order to escape the projectiles of anti-aircraft guns, columns of transport or of men are easily missed. Indeed, at a first attempt, an observer will see nothing which is of military value, for it is only after considerable practice that the eye becomes accustomed to scouring a great stretch of country from above, and acquires the power of distinguishing objects upon it."

"Psychology also comes in, and the temperament of an observer is of the greatest importance. He must be cool and capable of great concentration, in order to keep his attention fixed upon his objective in spite of all distractions, such as, for instance, the bursts of shell close to him, or the noise of rifle bullets passing through the planes of his machine. He must withstand the temptation to make conjectures, or to think that he has seen something when he is not absolutely certain of the fact, since an error in observing or an inaccuracy in reporting may lead to false conclusions and cause infinite harm."

"Many men are absolutely unfitted for such duty, and even trained observers vary in their powers of reconnaissance. Some have a special aptitude for strategical work, the wide field of action and the chance of gaining an insight, as it were, into the workings of the enemy's mind appealing to their imagination and to their taste for discovery."

"The spirit of adventure also enters, for long reconnaissances are hazardous; and before the minds of those carrying them out the prospect of being forced by engine trouble to descend in the enemy's lines cannot but frequently be present."

In the *communiqué* issued in Paris on Monday night, there was the following item:—

"In Champagne German aeroplanes flew over our positions. They were received with cannon and machine-gun fire, and two of them came down within our lines, in

the direction of Bar-le-Duc. The machines were almost intact. The four aviators were made prisoners."

In the despatch from the French official "Eye-witness," issued in Paris on January 18th, there were the following references to aerial work. In writing of the operations along the Yser, he stated:—

"We had then to assure our communications. For that purpose we undertook the construction of a strong bridge, to which the men gave the name of 'General Joffre.' The German aviators discovered the work at once, and it was moreover visible to the German artillery at high tide, but all the enemy's efforts were idle, and his fire did not damage the bridge. The furious bombardment of Nieuport town and Nieuport Bains, which achieved no purpose, was a reprisal for this failure. . . .

"On January 11th an Albatros, flying at a height of 2,800 metres, was chased over Arras by one of our aeroplanes, which forced him to return to the German lines. On the night of January 12th-13th an air squadron bombarded the railway station at Noyon, which was brilliantly lighted, and they dropped 14 bombs on it. On January 13th a French aeroplane bombarded the railway track behind Altkirch and Carspach, in Alsace, and the railway station at Remilly-sur-Nied, in Lorraine. On the same day two French aeroplanes gave chase to a German machine which was making for Nancy. A letter from Lorraine confirmed the success of the bombardment of Remilly on December 27th; some soldiers were killed,

and the railway line between Remilly and Peaudrecourt was broken up.

"Finally, the pilot Gilbert and Lieutenant Puechredon the observer defeated an enemy aeroplane in circumstances well worthy of mention. Gilbert and Puechredon were on January 10th near Chaulnes, on their way back from making a reconnaissance, when they saw an enemy aeroplane making for Amiens. They pursued it, flying high, in order to be able to overtake it without being seen. Not far from Amiens they caught it up and cut it off. The observer fired four shots with his carbine. Two of these hit the enemy observer, Lieutenant von Falkenstein (not Falkenhayn, as was wrongly stated), and the third struck the pilot Keller in the neck, while the fourth pierced the radiator. The wounded pilot brought his machine to the ground, and was at once taken prisoner.

"This was the third time that Sergeant Gilbert, who has received the Military Medal, has succeeded in bringing down enemy aircraft. The first time was on November 2nd during a reconnaissance in company with Captain de Vergnette, squadron commander, who acted as observer. He gave chase to an aeroplane over the enemy's lines, and after three shots the German machine (owing no doubt to the fact that its pilot was seriously wounded) disappeared, making an exceedingly steep flight, and fell to the ground in a field, where it appeared to be smashed to bits."

✱ ✱ ✱ ✱

THE ROYAL FLYING CORPS.

REORGANISATION OF MILITARY WING.

AN Army Order issued on Monday details the reorganisation of the Military Wing of the Royal Flying Corps. The Corps will be formed into wings, each with its commanding officer, and the post of O.C. Royal Flying Corps is abolished. Lieutenant-Colonel F. H. Sykes, 15th Hussars, held the latter appointment, and was recently gazetted as a General Staff Officer of the First Grade. The Army Order sets out the following points:—

The Royal Flying Corps (Military Wing) will be organised in wings, each under a separate commanding officer and consisting of two, three, or, in special cases, four squadrons.

An additional Wing Commander, designated the Administrative Wing Commander, will command the Royal Flying Corps depôt, and be the officer in charge of Royal Flying Corps records. In war he will also command the Reserve Aeroplane Squadrons and the Aircraft Park at home.

The appointment of Officer commanding the Royal Flying Corps (Military Wing) is abolished.

Provisional establishments for Flying headquarters, for the headquarters of the Administrative Wing, and for the Royal Flying Corps depôt are issued.

Wing Commanders will be responsible for the training and administration of their wings, including accounting for equipment, clothing, and necessaries.

The Adjutant will assist the Wing Commander in all questions of training and discipline.

The Equipment Officer will assist the Wing Commander in all questions concerning technical stores; he will account for all technical stores on charge of the wing, making such issues to Squadron Commanders as may be necessary to maintain the equipment of their squadrons. He will obtain receipts from Squadron Commanders for all issues, and will grant receipts for all stores returned,

but there will be no ledger transactions between Squadron Commanders and Equipment Officers.

The Administrative Wing Commander will carry out similar duties as regards the Reserve Aeroplane Squadrons, the Royal Flying Corps depôt, and the Aircraft Park; he will also be responsible for the final approval of all recruits, and for the recruiting of men specially enlisted during war; for the allotment of *personnel* to squadrons, for the despatch of reinforcements of *personnel* abroad, and for preparing the monthly statement of allowances and extra pay of all the officers of the Royal Flying Corps.

Personnel will on enlistment be sent to the Royal Flying Corps depôt for training. Here they will be trained not only in the ordinary duties of a soldier, but also in their technical duties as air-mechanics in the technical section of the Royal Flying Corps depôt. From the depôt they will be drafted to wings according to requirements. Training at the depôt will normally take six months, but will often be much curtailed during war.

Promotion to the rank of sergeant will be made by Wing Commanders; promotions above the rank of sergeant will be based on the recommendations of Wing Commanders and authorised by the Officer in Charge of Records from a general roll of non-commissioned officers kept by him.

The establishments will be as follows:—

	Officers.	Sergeants.	Corporals.	Air Mechanics and Privates.	Total.
Wing Headquarters ...	3	6	3	18	30
Administrative Wing ...	4	3	11 rank and file	—	18
Records and Recruiting	2	7 civilians	—	—	9
Depôt ...	7	10*	228 rank and file	—	246

* And 1 Warrant Officer.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

SPECIAL COMMITTEE MEETING.

A SPECIAL Meeting of the Committee was held on Tuesday, the 19th inst., when there were present: Prof. A. K. Huntington, in the Chair, Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Flight Lieut. F. K. McClean, R.N.A.S., Mr. Alec Ogilvie, Mr. C. F. Pollock, Mr. T. O. M. Sopwith, and the Assistant Secretary.

Election of Members.—The following New Members were elected:—

Clifford Roger Fleming-Williams.
Lieut. Charles Malcolm Hay, R.N.V.R.
Lieut. Charles Hubert Igglesden, R.E. (Territorial).
Harold Francis Smalman-Smith.

Aviators' Certificates.—The granting of the following Aviators' Certificates was confirmed:—

- 1033 Lieut. Chisholm Wilfred Anstey, S.W.B. (Maurice Farman Biplane, Central Flying School, Upavon). Jan. 2nd, 1915.
- 1034 Lieut. Dawson Calybut Downing, R.N. (Maurice Farman Biplane, Central Flying School, Upavon). Jan. 6th, 1915.
- 1035 2nd Lieut. Basil Henry Ryder, R.F.A. (Maurice Farman Biplane, Netheravon Flying School, Netheravon). Jan. 6th, 1915.
- 1036 Capt. Philip Babington (9th Hants Regiment) (Maurice Farman Biplane, Netheravon Flying School, Netheravon). Jan. 7th, 1915.
- 1037 Flight Sub-Lieut. James Conrad Peter Wood, R.N.A.S. (Bristol Biplane, Royal Naval Air Station, Hendon). Jan. 10th, 1915.

The following Aviators' Certificates were granted:—

- 1038 2nd Lieut. Crathorne Edward Isham Chalton Anne (K.O.V.L.I.) (Maurice Farman Biplane, Central Flying School, Upavon). Jan. 12th, 1915.
- 1039 William Arthur Grattan Bellew (Maurice Farman Biplane, Military School, Brooklands). Jan. 17th, 1915.
- 1040 Vyvyan Arthur Hemming Robeson (Maurice Farman Biplane, Military School, Brooklands). Jan. 18th, 1915.

Mortimer Singer Long Distance Balloon Race.—The Committee considered the log sheet of Balloon Trip made by Mrs. A. Mortimer Singer, accompanied by Mr. A. Mortimer Singer and Mr. C. F. Pollock, on the 16th May, 1914, when the ascent was made from Battersea and the descent at St. Clether, near Camel-ford, Cornwall, a distance of about 205 miles.

It was unanimously resolved:—

"That the Cup be awarded to Mrs. A. Mortimer Singer."

Britannia Trophy.—The Committee considered the various performances of British Aviators during the year 1914 up to the time of the War.

It was unanimously resolved:—

"That the Britannia Trophy for the year 1914 be awarded to Squadron-Commander J. W. Seddon, of the Royal Naval Air Service, for his seaplane flight on January 21st, 1914, from Isle of Grain to Plymouth, via Calshot."

Commander Seddon, accompanied by a passenger, left Isle of Grain on a Maurice-Farman Seaplane, at 9.15 a.m., arriving at Plymouth about 4.20 p.m., having made one stop, viz., at Calshot, for 1 hour 40 minutes. The flight was made round the coast, the distance being approximately 325 miles.

B. STEVENSON, Assistant Secretary.

166, Piccadilly, W.

THE FLYING SERVICES FUND.

Administered by The Royal Aero Club.

The Lords Commissioners of the Admiralty and the Army Council having signified their approval, the Royal Aero Club has instituted and will administer a fund originated by M. André Michelin for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependents of those who are killed.

The fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers and men.

In view of the great utility of the work of the Flying Services, evidence of which has been repeatedly given in the official despatches of the Commander-in-Chief, the skilful and daring flights into enemy country, and the protection afforded by the continuous patrolling of our coast by aircraft, it is confidently expected that the British public will welcome this opportunity of showing their appreciation by subscribing promptly and liberally to the fund.

The Right Hon. Lord Kinnaird has kindly consented to act as Honorary Treasurer to the Fund.

Subscriptions should be forwarded to The Flying Services Fund, The Royal Aero Club, 166, Piccadilly,

London, W., or to Barclay and Co., Ltd., 1, Pall Mall East, London, S.W. Cheques should be crossed "Barclay and Co., Ltd."

TULLIBARDINE, Brig.-General,
Chairman of the Royal Aero Club.

The fund has been started with the following Subscriptions:—

	£	s.	d.		£	s.	d.
M. André Michelin, Chairman of the Michelin Tyre Co.	1,000	0	0	Mr. A. Mortimer Singer ...	100	0	0
The Royal Aero Club ...	1,000	0	0	Mr. James Radley ...	25	0	0
Flight-Lieutenant F. K. McClean, R.N.A.S.	1,000	0	0	Capt. W. Oswald Watt ...	20	0	0
Mr. T. O. M. Sopwith ...	1,000	0	0	Editor of FLIGHT ...	10	10	0
Mr. Alec Ogilvie ...	250	0	0	Mr. A. J. A. Wallace Barr	5	5	0
Mr. Griffith Brewer ...	100	0	0	Lieutenant N. Pemberton Billing ...	5	0	0
Mr. Norman Clark Neill ...	100	0	0	Mr. J. K. Burbridge ...	5	0	0
Mr. Paris Singer ...	100	0	0	Mr. E. H. Coles ...	5	0	0
				Mr. Oscar Coles ...	5	0	0
				Mr. C. G. Grey ...	5	0	0
				Mr. C. G. Grunhold ...	5	0	0
				Lieut. J. E. Pearce ...	5	0	0
				Mr. Arthur Sykes ...	1	1	0

ROYAL AERO CLUB,
166, PICCADILLY, LONDON, W.
January 22nd, 1915.

London Police and Air Raids.

ON Monday last Sir Edward Henry, the Commissioner of Metropolitan Police, issued a set of instructions concerning the measures which are to be taken by police officers in the event of an aerial attack on London being attempted. It is pointed out that these instructions are for the guidance of the police generally, and that any action must necessarily be dependent upon circumstances.

Reduced Lighting in Paris.

REGULATIONS were issued in Paris on Sunday by the Prefecture of Police enjoining householders to draw their blinds and close their shutters from nightfall till dawn in view of possible attacks by hostile aircraft. The regulations apply particularly to shop and café windows. Arrangements have also been made to darken the street lights should the necessity arise.

FROM THE BRITISH FLYING GROUNDS.

Bowness-on-Windermere.

Northern Aircraft Co.—Work during last week included R. O. Lashmar (55), with Mr. Rowland Ding as passenger, making excellent landings, whilst G. L. Railton (15), received instruction.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Tuesday last week, Probationary Flight Sub-Lieuts. Wood, Digby, Hallifax, Petter, Hilliard and Reed straights with Instructors Manton, Russell and Winter in passenger seat. Probationary Flight Sub-Lieuts. Walmesley and Besson solo straights; Mills, Driscoll and Besson and Mr. Greenwood solo circuits.

Wednesday, Probationary Flight Sub-Lieuts. Besson, Mills and Mr. Greenwood solo circuits. Probationary Flight Sub-Lieuts. Digby, Hallifax, Hilliard, Petter and Wood straights with Instructors Manton, Russell and Winter. Probationary Flight Sub-Lieut. Walmesley solo straights.

The rest of the week pupils kept in owing to high winds. Four machines were in use.

Beatty School.—The following pupils received instruction during last week:—Messrs J. D. Newberry (55), A. Gordon Bond (15), E. T. Anstey-Chave (75), P. E. Cornish (62), G. Merton (37), G. Beard (20), G. Donald (12), G. Perrot (15), T. F. Roche (20), B. de Meza (15), M. J. V. Miller (17), Lieut. Bannatyne (15), J. H. Ormsby (15), V. E. Faning (15), Gerrit Forbes (8), H. H. Bright (30), F. R. Laver (10), and J. H. Moore (6).

The new 60-70 h.p. machine was put into commission early in the week, and at once proved its value, for although five days out of the week were so very bad as to make it almost impossible to give training, quite a lot of flying was done.

The school equipment now consists of a 40 h.p. Wright biplane, a 50 h.p. Gnome-engined biplane, a 60-70 h.p. Wright biplane, a 50 h.p. Gnome-engined single seater *brevet* machine, and a Blériot-Penguin monoplane, the Instructors being Mr. George W. Beatty, E. Baumann, W. Roche-Kelly and G. Virgilio.

Hall School.—On Tuesday last week, Davy, Waterson, and McConnochie did good straights or rolls.

Wednesday, Waterson 6 good rolls. McConnochie 2 excellent straight flights at 10 ft. Instructor J. Rose.

On Tuesday, the new 2-seater was tested by Mr. J. L. Hall. She climbs 300 ft. per min., a very good rate for a 45 h.p. Anzani. The school is now exceedingly well equipped, there being three tractor biplanes in use, another being erected.



Copyright F. N. Birkett from the F.N.B. series of aviators.

Flight Sub-Lieut. T. K. Young, R.N.A.S., who secured his certificate at the Grahame-White School, Hendon, last month.

London and Provincial Aviation Co.—Messrs. W. T. Warren and M. G. Smiles were the instructors for last week. Pupils receiving instruction on L. and P. biplanes: Messrs. Abel, Laidler, England Derwin, Moore and Collett. Weather mostly unfavourable all the week.

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NAVALTUM WATERPLANE ANCHOR.

THE latest use to which Navaltum—the well-known aluminium alloy metal—has been put is for the manufacture of anchor-heads for hydro-aeroplanes. Navaltum is eminently suitable for such metal work, not only on account of its lightness, strength for strength, as compared with iron or steel, but owing to the fact that it possesses the advantage over aluminium and some other alloys of being unaffected

by sea water. The particular anchor-head shown in the accompanying sketch weighs only 13 lbs., whereas if it were made of iron the weight would be about

48 lbs., whilst it is just as strong. From this it will be realised that this alloy can be put to many other uses with advantage, and, in fact, it is already being so used with very good results. Its specific gravity is from 2.2 to 2.8, whilst it has a tensile strength of from about 9 to 25 tons per sq. in., according to the different grades.

Very clean castings can be made from Navaltum, and it can easily be drawn and rolled. When first introduced there was considerable prejudice against the metal, as it was feared that it could not be worked satisfactorily; but we learn from Messrs. Navaltum Ltd., of Jubilee Place, Chelsea, London, S.W., that in the light of practical experience this prejudice has now almost disappeared, with the result that new applications of the metal are continually being made.

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obtained by sending 2d. to the publishers, 44, St. Martin's Lane, London, W.C. After February 12th the price will be 6d. post free.

Index and Title Page for Vol. VI.

THE Index and Title Page for Vol. VI, January to December, 1914, has now been printed, and can be

HYDROMECHANIC EXPERIMENTS WITH FLYING BOAT HULLS.

By H. C. RICHARDSON, Naval Constructor, U.S. Navy, Chairman of Sub-Committee on Hydromechanics in Relation to Aeronautics.

(Concluded from page 41).

FIG. 6 shows the resistance of the preceding models towed submerged at speeds up to 15 knots on a logarithmic diagram; and also for model 1350-15, a quarter sized model of the original Curtis pontoon. It will be seen that a straight line on the diagram very closely represents the locus of the observed points and thus indicate that the resistances of the models closely approximate the law of the square of the speed. As is well known, any equation of the form

from the equation $R \propto V^n$, the points being taken direct from the straight line plots.

Table I shows the computation of the head resistance in water for each of these models, in detail, the final results appearing in lines 19, 20 and 21, giving results by three different methods of computation.

Table II, line 22, gives the head resistance

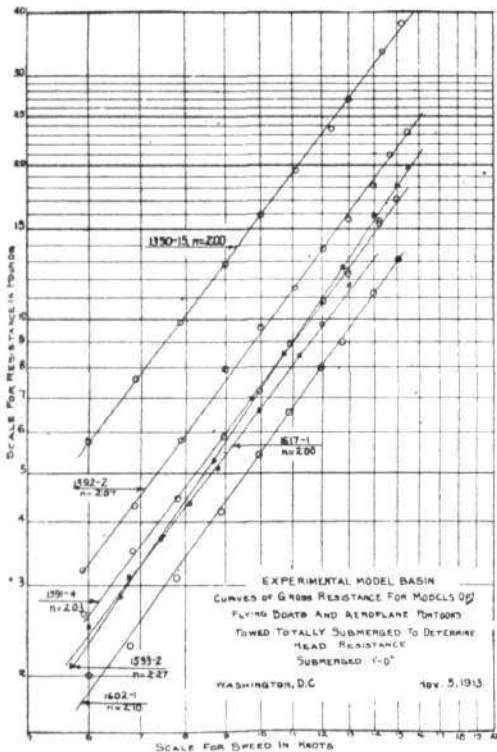


Fig. 6.

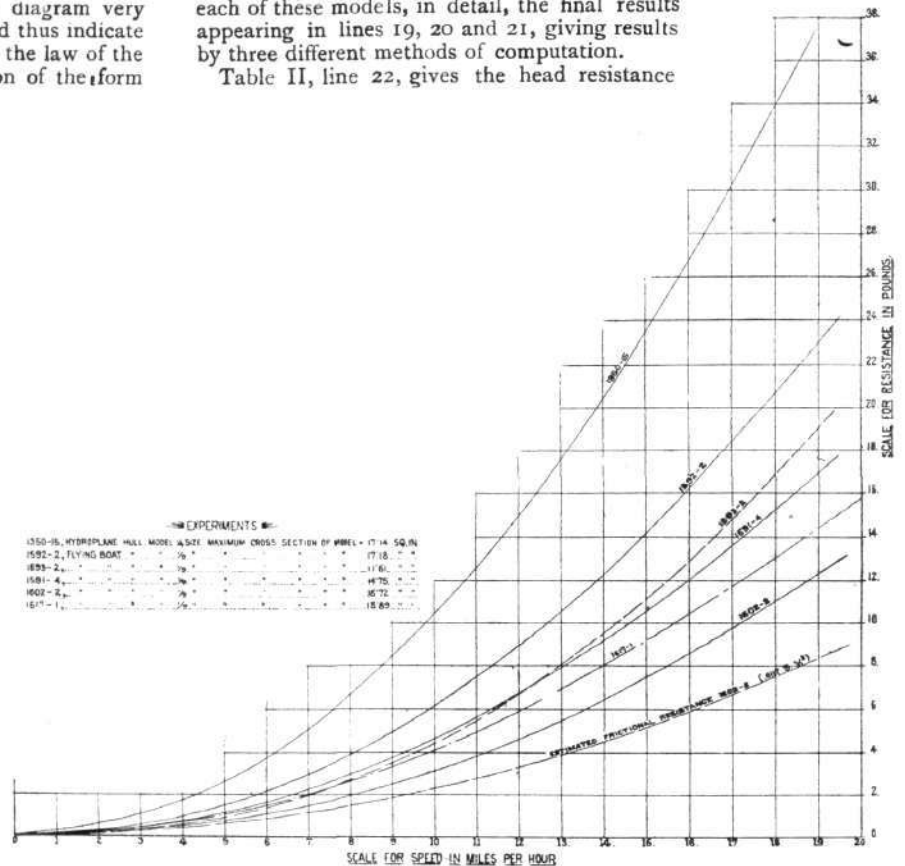


Fig. 7.—Curves of net total resistance for aeroplane hulls and flying boats towed submerged one foot to determine head resistance.

$Y = a x^n$ will plot as a straight line on a logarithmic plot, and the slope of the curve transferred to the origin passes through the margin at the upper end at a point corresponding to the exponent n . The exponents are given in line 12 of Table I, which shows the value of the exponent n in the equation of the lines plotted on Fig. 7

computed by analysis of the total resistance of the model into frictional resistance and residual resistance, and then augmenting these values to the "full size" values in accordance with Froude's method.

Line 23 gives the head resistance in the same manner as line 22,

TABLE I.—Computation of Head Resistance of Aeroplane Hulls, from Resistances of Models Towed Submerged in Model Basin.

Model.	A-1.	C-1.	D-1.	N-1.	N-2.	N-3.
1. Number	1350-15	1592-2	1593-2	1591-4	1602-2	1617-2
2. Linear ratio, full size to model	4	9	9	9	9	9
3. Wetted surface of model in sq. ft.	5'95	2'440	2'488	2'688	2'618	2'144
4. Wetted surface, full size, in sq. ft.	95'25	197'5	201'5	218'0	212'0	173'6
5. Maximum section of model in sq. ft.	0'118	0'119	0'081	0'103	0'116	0'146
6. Maximum section, full size, in sq. ft.	1'91	9'65	6'55	8'3	9'4	11'86
7. Speed of model, m.p.h.	20	20	20	20	20	20
8. Speed of model, k.p.h.	17'38	17'38	17'38	17'38	17'38	17'38
9. Corresponding speed, full size, m.p.h.	40	60	60	60	60	60
10. Corresponding speed, full size, k.p.h.	34'76	52'14	52'14	52'14	52'14	52'14
11. Total resistance of model at v m.p.h.	41'25	25'4	21'2	18'65	13'65	15'8
12. Exponent of v with which r_t varies	2'0	2'07	2'27	2'03	2'1	1'96
13. Frictional resistance of model $0'0117sv^{2.0}$	21'0	8'63	8'8	9'54	9'25	7'58
14. Residual resistance of model	20'25	16'77	12'4	9'11	4'4	8'22
15. Exponent of v with which r_r varies	2'0	2'06	2'48	2'00	2'28	1'91
16. Residual resistance of full size at V m.p.h.	1,295	12,250	9,050	6,630	3,210	5,992
17. Residual resistance of full size at V m.p.h.	1,296	13,060	15,490	6,570	5,183	5,430
18. Frictional resistance at V m.p.h., full size	672	2,970	3,025	3,270	3,180	1,506
19. Total resistance at V m.p.h., full size	1,967	15,220	12,075	9,900	6,390	7,498
20. Total resistance at V m.p.h., full size	1,968	16,030	18,515	9,840	8,363	6,936
21. Total resistance at V m.p.h., full size	2,640	18,500	15,450	13,600	9,950	11,518

TABLE II.

Model.	A-1.	C-1.	D-1.	N-1.	N-2.	N-3.
1. Number	1350-15	1592-2	1593-2	1591-4	1602-2	1617-2
19. Total resistance in water, Table I $R_t + R_i = R_e$	1,967	15,220	12,075	9,900	6,390	7,498
20. Total resistance in water, Table I $R'_t + R_i + R'_i$	1,968	16,030	18,515	9,840	8,363	6,936
21. Total resistance in water, Table I $K^2 r_t = R''_t$	2,640	18,500	15,450	13,600	9,950	11,518
22. Resistance in air, full size, at V m.p.h. $R_t/813 = H_1 \#$	2.42	18.72	14.85	12.18	7.86	9.22
23. Resistance in air, full size, at V m.p.h. $R'_t/813 = H_2 \#$	2.42	19.72	22.77	12.15	10.29	8.53
24. Resistance in air, full size, at V m.p.h. $R''_t/813 = H_3 \#$	3.24	22.75	19.00	16.73	12.24	14.17
25. Resistance in air, full size $K\rho v^{0.14} V^{1.86} L^{1.86}$ (Rayleigh) = $H_1 \#$	3.48	20.56	17.16	15.09	11.05	12.78
26. Resistance in air of normal plane of equal maximum section $c_0 33AV^2 = H_3 \#$	10.10	114.5	77.7	86.5	111.6	141.0
27. Ratio in per cent. $H_1/H_3 =$	107.2	90.3	90.3	90.00	90.3	90.25
28. Fineness coefficient, assuming H_1 as best value $H_1/H_3 = F$	0.34	0.179	0.221	0.156	0.0991	0.0906
29. Excess resistance at 60 m.p.h., over 1602-2 = E	*	9.5 #	9.5 #	4.04 #	--	1.74 #
30. $(K\rho v^{0.14})$ from model tests, "form factor" = F'	0.0000258	0.0000364	0.00002984	0.0000239	0.0000183	0.0000261

* Model of radically different form from others.

except the residual resistance is determined on the basis of relative areas and relative speeds, being proportioned to the latter in accordance with the exponent determined for the variation of residual resistance of the model, instead of using the law of the square.

Line 24 is an *approximation*, assuming the resistance to be directly proportional to the cube of the linear ratio at "corresponding speeds."

Line 25 is computed on the basis of the Lord Rayleigh method, which has been found reasonably satisfactory for the comparison of dirigible models in England. In England ebonite models 1 in. in diameter were used in water, and in air gold-beater's skin models 3 ft. in diameter.

The National Physical Laboratory formula, which is based on the Lord Rayleigh method, is $H = \kappa \rho v^{0.14} L^{1.86} V^{1.86}$, in which κ is a constant of form to be derived by experiment, ρ is the density of the medium in which the experiment is carried on, v is the kinetic viscosity, L is the length in feet, and V is the velocity in feet per second.

This method has been introduced at the suggestion of Naval Constructor J. C. Hunsaker, in commenting on the proofs of this paper as originally written. He further suggested the comparison, with line 24, which is of peculiar interest as shown by the percentage relation of these values. Investigation of the relation of the two methods as per line 27, shows that if we confine the use of the "approximate" method to the "corresponding speed," as per the Law of Comparison, the values as determined by Lord Rayleigh's method should be 90.25 per cent. of the values attained by the approximate method, for models one-ninth the full size, and 107 per cent. for models one-quarter the full size, so that the approximate method, which is much simpler, can be used with a fair degree of accuracy if we put it in the form $H_e = 0.00176 K^{2.73} r_t$.

This assumes $\rho_1 = 0.00123$ and $\nu_1 = 13$.

Line 26 gives the head resistance of a plane or the maximum section according to Eiffel's coefficient for flat plates normal to the wind.

Line 28 gives a fineness coefficient based on the comparison of lines 25 and 26.

Line 30 gives the value of $\kappa \rho v^{0.14}$ for each of the boat models. These "form factors" are of interest when compared with the values of the same coefficients for models of dirigibles in which the form is unrestricted by requirements such as enter into the flying boat problem. Thus to make the comparison more ready, Table III is compiled:

TABLE III.

Model.	Type.	$\kappa \rho v^{0.14}$ (air).	Model.	Type.	$\kappa \rho v^{0.14}$ (air).
N.P.L.	Dirigible ...	0.000152	A-1 ...	Pontoon ...	0.000258
Beta ...	"	0.000164	C-1 ...	Flying boat	0.000364
Gamma ...	"	0.000165	D-1 ...	"	0.000298
B.F. 36	"	0.000142	N-2 ...	"	0.000183
Lebaudy	"	0.000124	N-3 ...	Owl ...	0.000261
B.F. 32	"	0.000140			

It thus appears that the N-2 form, while superior in the air to the other flying boat forms, may still be improved, and if the efficiency of the Lebaudy form could be approached its head resistance might be reduced to 68 per cent. of the present value.

However, when we come to consider that the total head resistance of the N-2 model is only about 11 # in air at 60 m.p.h., and consider the difficulty of construction involved, particularly if the surface running qualities are to be retained, we see that the present forms are reasonably satisfactory. While the possible saving of 3.5 # head resistance is worth considering, it must only be considered if its attainment does not involve increased weight, cost or difficulty of construction to such a degree as to outweigh the small gain possible. Such savings increase in importance in proportion to the square of the speed desired. It thus appears that increased efficiency must be aimed at in those members of the structure which offend to a greater degree than the hull, namely, the multiplicity of the truss members; and the exposed power plant, especially the water-cooled power plant.

The peculiar form of Model 1617-1 is due to an attempt to utilise the advantage of the flying boat arrangement of bottom and step, together with a good shape stream-line hood in place of the ordinary pontoon with the hydro-aeroplane type of machine.

It is interesting to note that the coefficient of fineness of this model is less than that for Model 1602-2, which indicates that per unit of area of maximum section the resistance of this form is slightly less than that of the 1602 model. An inspection of line 29 will show that the probable reason for this is due to the very low value of the frictional component of the resistance of this model. However, when the comparison is based on $\kappa \rho v^{0.14}$, the form factor used by Lord Rayleigh, this form is much coarser than the 1602 model.

An independent experiment is worthy of note at this time. An experiment was made to determine the existence and amount of "nosing" torque on model 1350, at various angles of incidence. Unfortunately the apparatus carried away before the experiments were completed, but it was found that there is a "nosing" torque of about 90 ft. lbs. when the deck of the pontoon is parallel with the line of flight. To this torque should be added that due to the head resistance, which is approximately 5.42 lbs. \times 5 ft. = 26.10 ft. lbs. or a total torque due to the pontoon tending to make the machine head down of about 116 ft. lbs. This with the c.p. of the diving rudder 15 ft. abaft the c.g. would require the diving rudder to carry a negative load of about 7.75 lbs. if the machine were "balanced" for all other effects, at 60 m.p.h.

Additional experiments on submerged models are contemplated with a view to determining the stream-line flow about the models as a means of arriving at improvement of form, and other experiments to determine the effects of the cockpit openings, sponsons, &c., and a more complete series for determining torque at different angles.



Not a Zeppelin Raid.

AN interesting report just issued by Professor Jenkins, of the Godlee Observatory, Manchester, recalls the rumours of a Zeppelin raid on the Cottonopolis district on October 13th, when "a strange luminous body was seen in the sky emitting what seemed to be explosions. A large meteorite was found next morning at Appley Bridge, near Wigan, and Professor Jenkins reports that it is the usual sort of meteorite, its total weight—it is in two pieces—being 28 lbs. 13 oz. It is composed chiefly of silica and magnesia, with traces of other elements, and its specific gravity is 3.3 times that of water. The size is 9.6 ins. by 9.1 by 6.6, and the stone ranks as the second largest known to Great Britain, the larger one being a meteorite which fell in Yorkshire in 1795.

THE PALMER CORD AERO TYRE AND RIM.

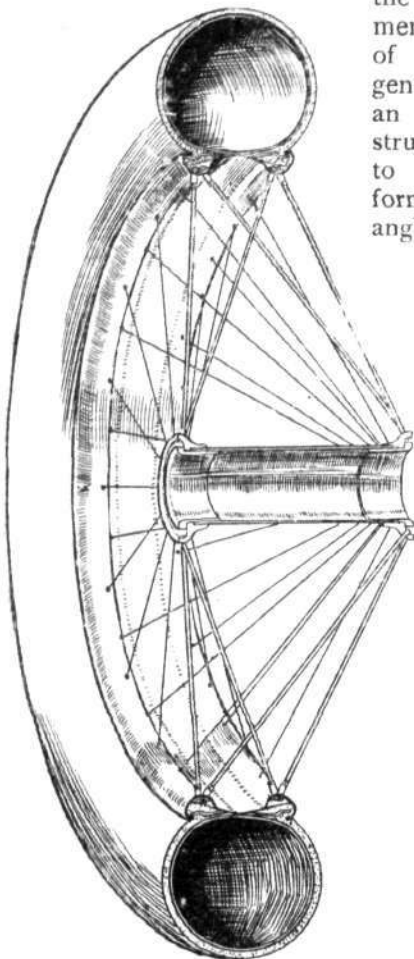
THERE has of late years been a marked tendency towards greater simplicity in aeroplane design, not only for aerodynamical reasons, but also in order to facilitate replacements. In no other part of the modern machine has this tendency probably been more pronounced than in

the under-carriage, which member has in the course of time been reduced, generally speaking, from an elaborate system of struts, skids, and wheels to four simple struts forming two V's, in the angle of which rests the

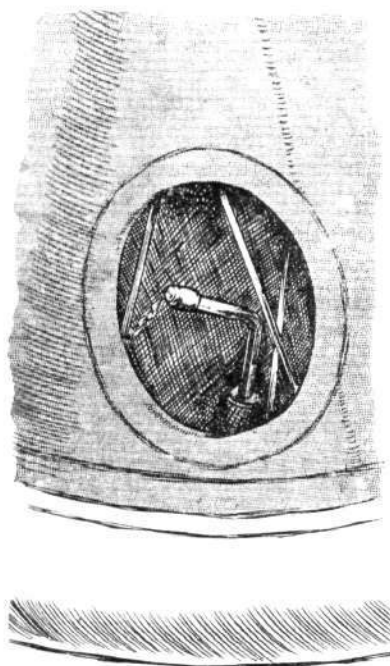
absorbing devices has naturally been that extra work is thrown on the tyres and wheels, which should therefore be proportionately strengthened, not by adding extra weight, if it is avoidable, but rather by scientific design of these parts, utilising the bulk already existing to the best possible advantage.

It has been found in practice that the ordinary type of tyres used on cycles and motor cars frequently gave trouble when fitted on an aeroplane, as the lateral stresses in the tyre due to landing in a side wind were often great enough to pull the bead out of the rim, thus allowing the air tube to blow underneath and burst. In some cases the whole tyre was wrenched bodily off the rim. In the Palmer Cord Aero Tyre and Rim this difficulty has been overcome in a very simple and ingenious way by giving the rim a particular form as seen in one of the accompanying illustrations, and by incorporating into the bead of the tyre steel staples which give rigidity to the bead and prevent it from pulling out.

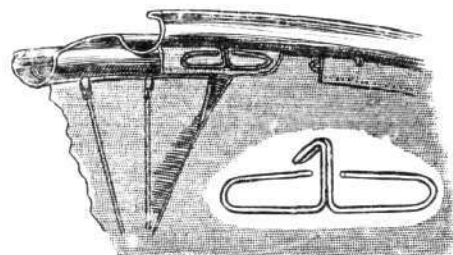
The inner ends of these staples rest on the raised centre portion of the rim, whilst their outer ends project outwards to the edge of the bead, locking the latter in position in the rim. In order to add to the resiliency of the tyres the spokes of the wheels



Section through a Palmer cord aero tyre and off-set wheel.



The tyre valve is given an angle in order to facilitate getting the pump screwed on.



Sketch showing spring hooks, by means of which side covers are attached to the wheels.

tubular axle carrying the two wheels. There was a time when most designers considered it not only desirable but practically necessary to provide some means for lessening the lateral strain imposed upon wheels and tyres when a pilot inadvertently or by force of circumstances landed his machine in a side wind—that is to say, with a greater or smaller amount of “drift.” The demand for high-speed machines has necessitated a reduction in head resistance wherever possible, and, as one of the results, devices for taking lateral strains on the wheels have in many cases disappeared, whilst shock absorbers have been either carefully stream-lined or frequently omitted entirely. The effect of this rigid economy in shock

are given a certain amount of play at the hub, so that in case of severe shocks each spoke is allowed to move inwards about $\frac{1}{8}$ ". Side covers of “doped” fabric are provided, and the method of attaching these to the rim is highly ingenious. Small spring hooks sewn into the edge tape of the cover engage with corresponding holes in the rim, and the covers are attached or removed with great ease by means of a simple tool resembling an ordinary button hook.

A visit to the Palmer Tyre Co., the makers of this highly efficient tyre, at 119, Shaftesbury Avenue, would well repay any of our readers materially interested in this side of the industry.



R.F.C. Officer Killed in France.

ACCORDING to a message from Paris, a Voisin biplane, while being flown over the French capital by Laporte, fell at the Pont de Grenelle, near the Eiffel Tower. The passenger, Capt. Chinnery of the Royal Flying Corps, is stated to have been killed on the spot; the pilot was dragged from the wreckage and taken to the Boucicault Hospital, where he succumbed to internal injuries. The cause of the accident is not known, but an eye-witness stated that the machine was in flames and flying very low just before it fell.



Fatal Accident at Farnborough.

WHILE making a descent after a flight at Farnborough on Tuesday, a Maurice Farman biplane, piloted by Second Lieut. N. L. Gardner, caught fire, and the pilot was burnt to death before he could be extricated.

Fatal Accident to Gradel.

THE French pilot Gradel was killed in an accident at Bethune last Friday. He was returning from a reconnaissance, and when attempting to land in a high wind the machine fell from a height of about sixty feet. The pilot sustained a fractured skull, and died almost immediately.

EDDIES.

REMARKABLY good qualities—both speed and climbing—are possessed by several of the more recent school machines at Hendon. By way of instance, a new school biplane built by the Hall Aviation Co. and fitted with a 45 h.p. Anzani engine topped the 1,000 ft. the other day in the space of 3 mins. Well-designed machines, however, are not much good without efficient motor power, and in this respect the Anzani engine, which is certainly running with the smoothness of a top, is entitled in all fairness to divide the honours.

x x x

Another new biplane, also with an Anzani engine, built by the London and Provincial Aviation Co., reached an altitude of 3,000 ft. in three circuits of the aerodrome, which is distinctly good climbing, considering that the h.p. is in this case only 35. Several other new machines may be expected to emerge from the L. and P. works before long, some of which will be of much higher power than those hitherto in use at this school. I am not at present allowed to say much about them, but one will be a biplane of the tractor type, and probably fitted with a—there, I nearly broke my word to Mr. Warren not to divulge too much. Warren believes in deeds, not words.

x x x

The 60 h.p. Wright engine having now been installed in the Beatty-Wright biplane, this machine has been thoroughly tested, and Mr. Beatty is delighted with the performances of both. With two up it has been found that the engine on half throttle gives quite enough power for ordinary flying, so that there is any amount of reserve power for emergency. For instructing pupils in windy weather this new biplane is, to use a Beattysm, "some bus."

x x x

In spite of busy-ness in other directions, the Grahame-White biplane built for the postponed Circuit of Britain has now been re-erected as a land machine, and will, it is hoped, soon be in flying trim again. A new landing chassis is being fitted, and immediately the engine is to hand, which, I am assured, should be very soon, the machine will be tuned up and put through her paces. Her speed as a seaplane was exceptionally high, but with the reduced resistance of the landing chassis there should be no difficulty in considerably improving upon it. If she is found as successful as a land machine as she was fitted with floats, she should have distinct possibilities for military purposes, for the view obtained is practically unrestricted both for pilot and passenger.

x x x

The following exciting adventure happened recently at the works of one of our best-known aviation companies. It was Saturday afternoon, the men had gone home. The works manager was inspecting the various departments to see that everything was in order for the week-end, and at the same time he was explaining to two friends the different machines. As is always the case in a large shop the stillness seemed very deep, following on the noise of machinery with which the building had resounded but a short time previously. In the metal work department several pieces of acetylene welding were inspected and admired, and the ringing of the steel as it was put down on the other parts lying on the bench emphasised the stillness of the great shop. Pulling back

one of the sliding doors, they entered the wood working department. Now and again the works manager would stop on his round to explain with pardonable pride some ingenious method of manufacturing a certain part with a minimum of labour and expense. Or again he would hold out a finished strut for them to admire, running his fingers caressingly along its smooth varnished surface. When their approval was adequately expressed, he would, with characteristic mannerism, stroke his moustache with the back of his hand, and a smile of satisfaction would cross his face.

x x x

The sawdust lying in little heaps on the floor around the various saws deadened the sound of their footsteps, and suddenly the manager broke off in the middle of a sentence, a puzzled look creeping into his eyes. "Did you hear that?" he asked. Neither of his visitors had heard anything unusual. "Keep still and hold your breath!" All three men stood quiet for a few seconds, listening intently. A low ticking could be heard very faintly. "It's a clock," all three exclaimed simultaneously, a smile fitting across the features of the two, while the manager's face became still more puzzled. "There's no business to be any clock in this room," he exclaimed with more feeling than grammar, lowering his voice, which, from the habit of having to speak in the din of a shop, is usually of a very penetrating character. Murmuring something to himself, he strode across the heaps of waste wood, and made for the cupboards lining the walls.



The quaint menu on Christmas Day of the Mechanics' Mess of the Royal Flying Corps.

Then began a game of "hot or cold." As the three walked to and fro the sound would grow louder or fainter. Finally, by a process of elimination, the sound was tracked down to a certain cupboard. The ticking was now unmistakably that of a clock. Stooping down, the three investigators were barely able to discern in the shadows a small round object with insulated cables leading away from it. The three men stood erect looking very undecided at one another, not knowing whether to run or to further investigate. The same thought flashed through their minds—A bomb! It is generally claimed that in moments of extreme danger a few seconds suffice to review one's whole life. By a similar mental process, the manager's mind at once conceived how easy it would be for some German to have secured employment at the works in order to get an opportunity to blow them up with a timed bomb. All this takes much longer to write than to happen, and before the manager could utter a warning one of the friends hauled out the mysterious object from beyond the shadows. It however proved to be only

a small dynamo which had been left partially unwound! The mysterious ticking still remained, and it was eventually traced to a cheap alarm clock belonging to one of the workmen.

x x x

It appears that some of the R.F.C. mechanics are not only artists with chisel and file, but can on occasion wield pen and brush to good purpose, as witness the menu card, seen in the accompanying photograph, which set out all the good things of which the mechanics' mess at Upavon partook on Christmas evening. These cards, by the way, must have entailed a considerable amount of work, as they were all drawn and coloured by hand. After the banquet followed a few hours of singing, playing, and general merry-making. Captain Paine, on looking in during the festivities to see that everything was in order, received a rousing greeting, and at the close of the evening, by my informant, there were no "dreary beggars" about.

"ÆOLUS."

✱ ✱ ✱ ✱ AIRCRAFT AND THE WAR.

In an article on the subject of the German aeroplanes which were recently sighted over the English Channel, the *Frankfurter Zeitung* of January 12th stated:—

"The flight over the Channel was not the accidental success of some especially clever airman, but a systematic attack carried out by a squadron of some sixteen aeroplanes. If the object of the raid—the cruise was no doubt intended to extend to the English capital—was not achieved, that was due not to uncommonly comprehensive defensive measures on the English coast, but purely to the thick fog, which hindered the operation. At any rate, Dover has been bombarded, and the terror which the expedition has unquestionably caused is easy to understand."

A *Daily Express* correspondent at Copenhagen, writing on January 13th, said:—

"A Berlin message states that a German aeroplane dropped bombs on Warsaw's main thoroughfare, the Moskowsky Prospect, and caused much damage.

"A linoleum factory was set on fire and various buildings were destroyed."

Mr. Granville Fortescue, writing to the *Daily Telegraph* from Warsaw on January 13th, said:—

"Aviators report much movement in Lowice, which has been interpreted as an evacuation. If this is so, the wave that threatened Warsaw has broken."

Writing from the Belgian frontier on January 13th to the *Daily Express*, Mr. Percival Phillips said:—

"It is the intention of the Germans in Flanders to develop the aerial phase of the campaign against the Allies' armies.

"This is shown by information reaching me to-day from several sources in Belgium. The recent despatch by the Germans of a fleet of more than a dozen Aviatik machines over towns in the possession of the Allies is merely one indication of the increasing strength of the raiders, whose energies are devoted to the dropping of bombs on undefended communities.

"In addition to the base at Ghistelles, which has already received a visit from a squadron of opposing aeroplanes, other bases are being constructed by the Germans in the vicinity of Ghent, Namur, and Liège.

"That the enemy realise the danger of attacks on a large scale by the aerial scouts of the Allies is shown, not only by the elaborate precautions the Germans are making to protect their hangars and petrol bases against bombs, but also by the establishment of night signal stations. These are furnished with searchlights, by which the Germans can intercommunicate between them.

"The inhabitants of the villages between Salzaete, Ghent, and Bruges were last night suddenly aroused from their beds by the firing of anti-aircraft guns. The frightened population could see the sky streaked with great moving bars of light as the men in charge of the German aerial defence stations in that region strove to locate what they believed to be hostile aeroplanes cruising eastward from the coast.

"There is nothing yet to show that there were any of the Allies' aeroplanes aloft over Flanders last night. The spectacular activity of the enemy may be due to one of many false alarms which they are continually receiving from the coast. Nevertheless this event is an interesting illustration of their activity in the attempt to frustrate surprise aerial attacks. It is an illustration, too, of their realisation that their contemplated campaign of 'terrorism' is a game at which two can play."

A message from a *Daily Telegraph* correspondent at Boulogne on the 14th inst. said:—

"News comes to hand that a German aeroplane was seen early to-day over Amiens, and was followed by a French aviator, who managed to bring the enemy to earth. The officers in the machine were killed. The aeroplane was captured intact."

A correspondent of the *Matin*, writing from Soissons on January 15th, in giving a description of the retreat across the Aisne, said:—

"A French aeroplane signalled the arrival of German reinforcements by rail from Laon. The aeroplane received orders to bombard the trains, but, after dropping several bombs, the machine and pilot were hit and compelled to descend to the north of Sainte Marguerite, between the two lines. French troops succeeded in rescuing the wounded pilot by a bayonet charge."

Mr. G. Ward Price, writing to the *Daily Mail* from Northern France on the 15th inst., said:—

"Yesterday two German aeroplanes set out again towards Dunkirk, but between that town and Furnes they passed over an anti-aircraft gun, which drove both of them back, one disappearing behind the line of dunes out to sea."

In a message from the Franco-Belgian border, received in London on Saturday night, a *Daily Chronicle* correspondent said:—

"News has just reached me that British aviators, working in conjunction with the French and Belgian aviators, have accomplished a successful air raid over Ostend.

"Several bombs were dropped on the railway station and military barracks. Loud explosions followed and the damage done is considerable. We suffered no casualties. Nine airmen are believed to have taken part.

"The British and other fliers were engaged with three German Taubes during the forenoon, and again in the afternoon.

"One of our machines was hit in nine places, but without impairing its immediate efficiency.

"From this machine no fewer than 18 bombs and half a dozen grenades were dropped on German military works and railway centres. Considerable damage was done to the railway at one point. It is not known what damage was done by the other bombs, but it was evident that the raid caused great consternation among the Germans."

In a message dealing with the fighting in the Champagne district a *Morning Post* correspondent wrote :—

"It is all very well for aeroplanes to detect trenches. We know they are there, dug into a solid chalky subsoil with sides to them like masonry. But from a range of ten miles—over twelve miles with some guns—to drop shells into trenches little more than a yard wide by two deep accurately and continuously, is well nigh impossible. The redoubts may suffer, but the shelters cannot to any effective extent, while, the whole place being mined like an ants' nest, local damage can be rapidly made good, and to blow the entire section of the globe in question into nothingness would involve something still more appalling in the way of gun fire than we have seen even in this appalling war."

A *Daily Telegraph* correspondent, writing from Petrograd on Sunday, said :—

"Interesting stories are told by Russians who have succeeded in getting through from Constantinople to Odessa. They relate that in consequence of the damage done by French aviators to the

Dardanelles forts, special guns for bringing down aeroplanes have been mounted in the trenches on Prince's Islands.

"It is also reported that French aviators have done effective execution with their bombs at Adrianople."

A *Morning Post* correspondent at Copenhagen reported the following on January 17th :—

"The German hydro-aeroplane 'Erna 84' has been washed ashore at Manø, on the west coast of Jutland. The aviators are presumed to have been drowned. On board her were found four grenades. It is stated that the hydro-aeroplane was built in November, 1914."

Writing to the *Daily Mail* from Paris on Monday relative to an attack by the Germans on St. Paul, near Soissons, Mr. George C. Curnock said :—

"Our artillery did marvels. Their fire was directed by aeroplanes, which flew, heedless of all dangers, into the hail of shell."

✠ ✠ ✠ RAIDING BY AIRCRAFT.

WHETHER Tuesday night's raid on the East Coast was by dirigibles or aeroplanes or both—and the evidence in this connection appears to be divided—is not a matter of very much moment. The fact that the long-promised raids have been inaugurated at last is the point of interest. As we have always stated, there was no reason why adventures of this character should not be organised—always provided that it was considered the game was worth the candle. In all probability this is but the first of other raids to follow, with London or other prominent centres as the objective. But that nothing will be attained by the Germans, beyond the murdering of a certain number of citizens and material damage to property, there is no possible doubt. As to the effect upon the general conduct of the war, beyond the tragic deaths of innocents which result from this style of "Kultur," such raids will be accepted as mere refined incidents in the humane methods practised by the Germans and will be regarded by the Empire as almost childish in their futility. That the pressure of public opinion in Germany as to the inactivity of both the Navy and the Aircraft Fleet is largely responsible for this week's doings is, we think, unquestionably the fact. One thing has emerged very strongly from this new experience, that there has not been the slightest sign of panic anywhere—except perhaps in the columns of some of the more pushful lay press—and their object is sufficiently obvious. As a matter of record, however, we give below the main facts as far as they are ascertainable, so that the historical "Kultur" departure may be appreciated for future generations to ponder over.

The aircraft first appeared over Yarmouth about 8.30 p.m., and dropped about ten bombs in different parts of the town, but many of these did not explode. The most serious damage was done near St. Peter's Plain, where a house and workshop were wrecked, a shoemaker, looking out from his door, and an old lady of 75 years of age, who had been shopping, being killed. A very large number of houses were damaged, and there were many marvellous escapes. A second bomb exploded at the Fish Wharf, where a drifter was considerably damaged by pieces of the bomb.

Cromer was next visited, but the authorities having been notified, the town was in darkness, and no bombs were dropped. It was also reported that "Zeppelins" were seen at Runton. Four bombs were dropped at Sheringham at 8.45, one going right through a house in Whitehall Yard, fortunately without exploding. The other three fell at the Beeston end of the town,

without doing any damage. About 10.30 the hostile aircraft were over Dersingham, and dropped a bomb there and others at Brancaster, Heacham, Snettisham, where a church was damaged, and Lynn. At 11 p.m. the aircraft were over King's Lynn, where at least seven bombs were dropped, the objectives apparently being the railway station, the post office, and the docks. On receipt of a warning of approaching aircraft, the work of extinguishing the lights of the town was commenced, but it had not been completed when the first bomb fell near the junction of the Hunstanton railway line with the London line. Another fell in some allotment gardens, and then two others fell on cottages in Bentinck and Melbourne Streets. In one house a boy of 16 was killed while asleep in bed, and in another a soldier's widow who was visiting some friends was killed, the other occupants of the house having miraculous escapes. Several houses in Albert Street were also damaged.

It was at first reported that bombs were dropped at Sandringham, where the Royal Family had been in residence up to the morning previous to the raid, but it was subsequently ascertained that no bombs had been dropped nearer to the spot than Snettisham.

Aircraft were again heard over Yarmouth just before midnight, but nothing untoward happened.

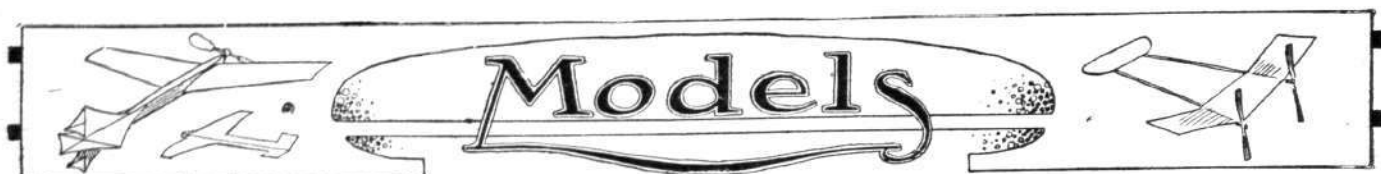
The official account by our own authorities as to what actually happened will be awaited with considerable interest, but up to the time of going to Press nothing has been issued.

The following official telegram from Berlin was received in Amsterdam on Wednesday :—

"On the night of January 19th naval airships undertook an attack on some fortified places on the English East Coast. The weather was foggy and rainy. Several bombs were successfully dropped. The airships were shot at, but returned unhurt.—(Signed) Deputy Chief of the Admiralty Staff VON BEHNKE."

According to the Dutch *Telegraaf*, three German airships were seen at midday on Tuesday at Nees, in the Island of Ameland, and at Terschelling, proceeding in a westerly direction. Two German airships were also reported as having been seen at the Dutch island of Skiermonnikoog. Reports were later received from some of these places of three airships returning eastwards.

The captain of the tug "United Service," arriving at Yarmouth from sea on Wednesday, reported that the master of the St. Nicholas Lightship saw a "Zeppelin" arrive from eastward just before 8.30 p.m. and return seawards about midnight on Tuesday.



Edited by V. E. JOHNSON, M.A.

Models Driven by Compressed Air.

(Continued from page 51.)

Copper Half-Balls for Container Ends.

IN a recent number we stated that brass half-balls of 2.5 ins. in diam. were the largest we could obtain ready made. Since then we find it is possible to obtain copper half-balls up to 6 ins. in diam., and even larger. These can be purchased from Messrs. Stanton Bros., 73, Shoe Lane, E.C., from whom the necessary brass or copper foil can be obtained. These semi-copper balls can be obtained either with a rim or without it, the smallest kept are the 3-in. diam. rimless ones. The 3-in. rimmed ones would fit a cylinder 3.25 ins. in diam. We purchased a pair of the latter at 6d. a pair.

The weight of a 2.5-in. brass half-ball (rimmed) is 14 grammes ($\frac{1}{2}$ oz.), of the 3-in. rimmed copper 46 grammes, or about 4 grammes less than $1\frac{1}{2}$ ozs.—the 46 grammes being, by the way, 2 grammes in excess of the weight of a 3.75-in. diam. brass half-ball spun for us by Messrs. J. Bonn and Co. The copper half-balls are thus somewhat heavy in proportion, but not prohibitively so. The rimmed semi-metal balls are considerably more rigid than those that are not.

Spirally-Wound Containers.

We have come to the conclusion that the cylindrical or truncated cone portion of the container is best made from foil wound spirally round and round the wooden former, leaving about $\frac{1}{4}$ -in. overlap, and not longitudinal joints from end to end. For one thing, it is undoubtedly stronger; in the second place, the diameter can be varied without requiring more joints, a very important item; and in the last place, the coil form in which the foil is kept naturally adapts itself to this formation, which it does not do in the other case, inequalities or kinks appearing, since the curvature is now at right angles to its coil winding, which tends to make cracks in the foil, which in their turn, become sure sources of leakage. These cracks are especially noticeable at the edges of the longitudinal joints. For containers of over 2 ins. in diameter, it also appears to be a very open question whether a foil of less than $\frac{1}{1000}$ of an inch in thickness does not do more harm than good.

A Compressed Air-Driven Flying Boat.

Several correspondents have asked us concerning the possibility of building hydro-aeroplanes of the flying-boat type, in which the motive power is compressed air. One correspondent informs us that a commercial compressed air-driven model hydro-aeroplane is already on the market. The latter fact we knew already, having seen the thing—a monoplane—autoplan plant apparently, cylindrical floats—sausage type, painted red—two in front (positive angle of incidence), one behind. (No doubt it will fly—anything will fly, for a time, if you only put on enough power. But, regarded from the point of view of design, it is a *bête-noir* unutterable.)

To return to the flying boat—what some of our correspondents have in mind, we expect, is making the boat-like hull the container. The idea is no doubt feasible; the model would have to be a tractor, or with the propellers just behind the mainplanes, and a biplane. The hull, *i.e.* the container, would require a step, which would present difficulties, and there is also the question of landing. A much better way is to enclose the container in the hull (of wood and silk), and not to make the actual outside shell of the hull itself the container. Undoubtedly such a model is both practicable and possible at the present time; whether it would turn out to be the best type of c.a. driven model hydro. is another matter. Actual practical experiments will no doubt solve this question too, in course of time. Any reader thinking of commencing experiments in this direction should carefully consult the article on "Hydromechanic Experiments with Flying Boat Hulls" in last week's issue.

Some Experiments with Compressed-Air Models.


By HORACE J. V. STEVENS.

"The following is a brief account of some experiments I have made on 'c.a.' models. As you see, I am now serving with the Colours, being billeted with my regiment in Dorking, so I am unable to send you any photographs of the plant. This I hope to do later, however, and in the meantime perhaps these few details may interest you.

"Mr. Bragg-Smith's model first interested me in c.a. models. My first plant was an oscillating engine [single-acting] fitted to a

container. The container, of weight 6 ozs., was 16 ins. long by 1 in. in diameter of solid drawn brass tube; a foot-pump barrel, in fact. The engine—bore $\frac{3}{8}$ in., stroke $\frac{3}{4}$ in.—drove a 12-ins. Centrale tractor, and complete weighed $2\frac{1}{2}$ ozs. Total weight of plant, $8\frac{1}{2}$ ozs. Such a small container gave a duration of only 10 secs., quite useless for a model, and so was abandoned.

A new container was, therefore, made, having nine times the capacity of the old container. It was $22\frac{3}{4}$ ins. long and $2\frac{3}{4}$ ins. in diameter. The hemispherical ends were purchased at Messrs. Stantons, in Shoe Lane, at 3d. each, weighing 1 oz. each. The body of the container was of thin sheet tin, having an

 type joint or seam. It was well soldered and bound with 32 s.w.g. wire, as in the autoplan plant. Total weight of container $8\frac{1}{2}$ ozs. The same engine and screw were used, making a plant of total weight 11 ozs. On test, under 100 pump-strokes (pump was an autoplan pump, as supplied by Gamages), thrust was 5 ozs. *maximum* during a duration of run of 50 secs. This plant was fitted to a simple tractor mono. of $19\frac{1}{2}$ ozs. total weight. Several long hops were made, *r.o.g.*, and a few hand-launched flights; the loading was $9\frac{1}{4}$ ozs. per sq. ft., thus preventing any long flights with such a low-powered model. However, I gained a good deal of very interesting data, and proceeded on an entirely new and improved model. I learned, as regards the plant, the following points:—(1) A single cylinder oscillating engine was of too uneven torque and balance for aeronautical purposes; (2) the container must be stronger to allow of greater pressures being used.

"As regards the model itself, (1) loading ought not to be too great, about 6-7 ozs. per sq. ft. would be about right.

"The new plant had a twin-cylinder, horizontally-opposed oscillating engine, having much better torque and balance. It was $\frac{3}{8}$ -in. bore by $\frac{1}{2}$ in. stroke, weight 2 ozs. It drives a $15\frac{1}{4}$ -in. diameter tractor of 22 in. pitch at about 1,500-1,700 r.p.m. The container is $20\frac{3}{4}$ ins. long by $2\frac{3}{4}$ ins. in diameter, with ends as in above-described container, but body is of 32 g. brass with a brazed seam. This container, though very strong, is very heavy, being 14 ozs. in weight. Weight of complete plant is $16\frac{1}{2}$ ozs. The thrust at full pressure (150 lbs. per sq. in.) is over 16 ozs.

"I recently fitted, during one of my rare periods of leave at home, a pressure-gauge reading up to 150 lbs. I found the 'strokes-pressure' ratio much the same as in the autoplan plant, *i.e.*, 1 lb. pressure per 1 stroke on the average. For instance, 60 strokes give 50 lbs. pressure; 80 strokes give 75 lbs.; 120 strokes give 120 lbs. pressure; 160 strokes give 150 lbs. pressure, and so on. At 50 lbs. pressure, the model just flies hand-launched; at 120 lbs. pressure, she rises off fairly good grass, but I cannot state for how long she flies, as I have little or rather no time now-a-days for testing it thoroughly. However, I tested it once on Mitcham Common in a howling gale one Saturday afternoon. Under 120 lbs. pressure, against the wind, the model fairly leaped up into the air, and being badly over-elevated, nose-dived, but flattened out and landed fairly well. It was a narrow shave for the engine, however! Since that occasion, save in my garden, where short hand-launched 'flights' have been made, the model has had to remain untested.

"On reading the above, I find I have completely forgotten to describe the model itself.

"It is a tractor model of 5 ft. 3 ins. span, by 3 ft. 9 ins. o.a.l. The total weight (minus compressed air) is 30 ozs.; loading 6 ozs. per sq. ft. Lifting surface of wings is 5 sq. ft. Wings are double-surfaced with Bonn's silk, and complete weigh 8 ozs. The tail is of Caudron design, of area 180 sq. ins., being 20 ins. by 9 ins. av. chord. Fin, also of Caudron design, is 8 ins. by 4 ins. and 32 sq. ins. area. Fuselage is of 2-member type, longitudinals being 3 ft. 6 ins. by $\frac{3}{8}$ in. by $\frac{1}{4}$ in. American whitewood. Chassis is of Morane type, of 16 g. steel wire. Wheels, 2 ins. diameter, rubber-tyred. Wings are 5 ft. 3 ins. by 1 ft. chord, having a moderate dihedral angle and an a.o.i. of 10° at roots, 'washing-out' to 2° at tips.

"The only novel point about the plant is the motor. One might think that an oscillating engine would be very wasteful of air, but my experience is that, provided of course that it is properly made, the leakage is very small, not more so than the autoplan engine. Mr. Jannaway kindly allowed me to examine and test his autoplan plant one evening, so I can speak with knowledge on the subject. The motor on my model naturally leaks past the cylinder and port faces, when it is not running, *i.e.*, when the air is turned on and the engine held. Leakage past the pistons is very slight, as telescopic

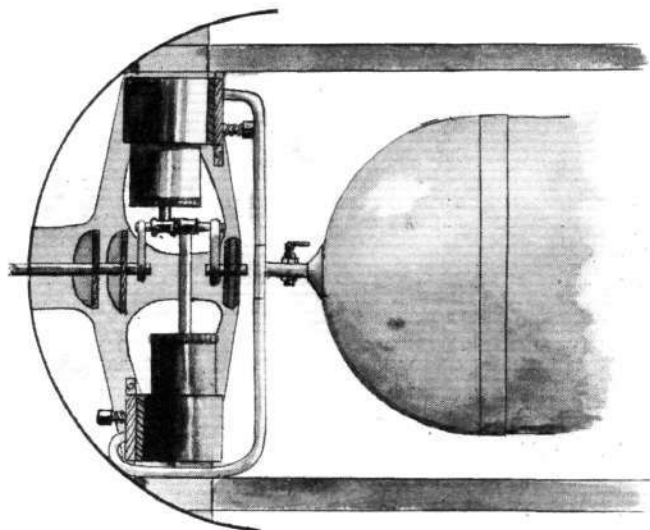
brass tubing was used in the construction of the cylinders and pistons.

"Fairly strong springs are needed to prevent the faces being blown apart; while the faces must be properly ground in with emery powder and oil. The air and exhaust ports must be as large as possible to obtain speed.

"The duration of run when container is fully charged (*i.e.* 160 strokes) is 45-50 secs., an effective r.o.g. thrust lasting for 15-20 secs.

"The torque and balance of engine are quite good. The engine runs at a tremendous speed *without* propeller or flywheel effect under about 25 lbs. pressure."

Referring to Mr. Stevens' very interesting communication, there is one point on which—from our own personal experience—we



A design for an oscillating C.A. engine, single acting opposed cylinders type, by T. H. Harper.

cannot agree with his deductions, and that is the question of leakage in the particular type of engine he refers to, a type of engine with respect to which another correspondent, Mr. T. H. Harper, has written, and whose design for such we publish herewith.

The one fact that, with such an initial pressure as 150 lbs. per sq. in. (a very high pressure), a useful thrust can only be obtained for from 15 to 20 secs. is, we think, in itself a proof of this. We have, as it happens, however, had some considerable experience with this type of engine, and have long ago given them up. They are not nearly so efficient as a double-acting cylinder one fitted with a cylindrical-shaped slide-valve. If you employ a strong spring to hold the faces together, you greatly increase your friction, and at low pressures 50 per cent. to 75 per cent. of your energy is so wasted. The steam or air pressure should tend to blow or press the faces *together* and not *apart*, and does do so in well-designed engines.

In spite of this, however, it by no means follows that the last word has been said with regard to oscillating engines—which can be

designed without any springs at all, and in which the compressed air or steam does not tend to blow the faces, be they flat or round, apart in this manner.

One great advantage in the oscillating type is the direct nature of the thrust of the piston-rod on to the crank-pin, without any intermediate connecting-rod, the angle of which is continually varying, thereby entailing very considerable side thrusts, and, therefore, so much lost energy. This is reduced as much as possible by making the connecting-rod as long as possible, and keeping the angle a minimum.

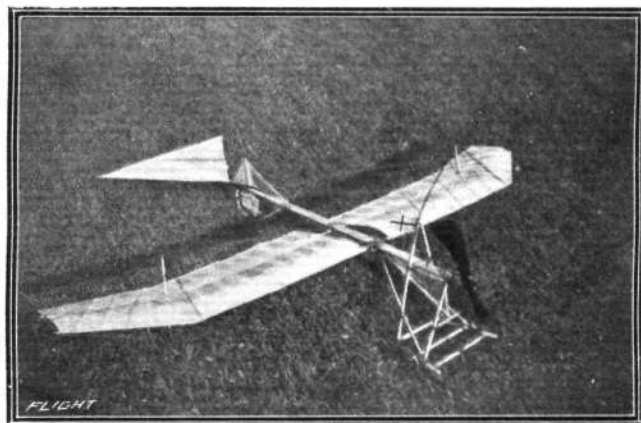
Instead of a fixed piston angle and a variable angle connecting-rod, in single-acting cylinders, a variable angle piston-rod takes the place of both.

If any reader thinks that such side thrusts do not amount to much, let him try and hold such a piston steady whilst it is working.

The fault and real drawback to oscillating cylinders is the vibrations such set up. How far this could be overcome by a well-designed and very carefully balanced pair of cylinders remains to be seen.

From this point of view, *viz.* vibration, the turbine stands easily first, but it appears impracticable in small model form.

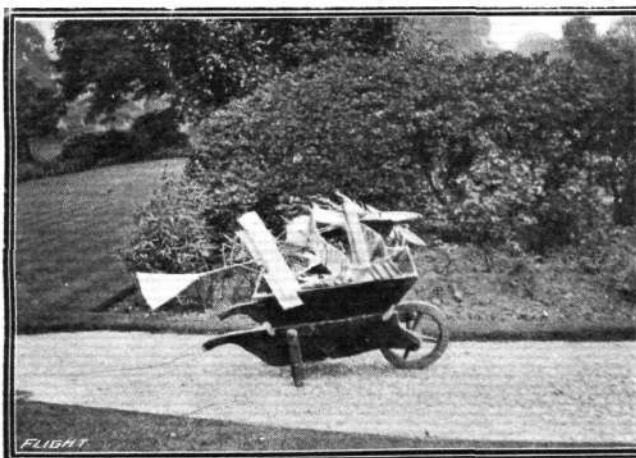
In spite of the fact that so many types of model steam engines have been on the market for so many years, there is plenty of scope yet for experiment; those who supply such motors commercially, naturally supply such types as sell the best; these, generally speaking, are prototypes of full-sized engines, and not necessarily such as give the best results as models. Moreover, except in aeronautics, the question of leakage is not one of such supreme importance.



MR. LANCELOT L. VIGERS' MONOPLANE, No. 25 (1914).—Span about 56 ins., weight about 1 lb., propeller 14 in. diameter, Bonn. Backbone is a hollow spar, and under-carriage is streamlined wood fitted into sockets made by J. Bonn and Co.

A Case of Necessity. By LANCELOT L. VIGERS.

In a recent issue of *FLIGHT* two photographs were reproduced of Mr. Kitchen's model during its last moments. I enclose photographs of a somewhat similar occurrence with a few of my models—the funeral procession and the funeral pyre. In my case it was



MR. LANCELOT L. VIGERS' FLEET OF MODELS.—On the left the "funeral procession," and on the right the models being consumed.

necessity that made it essential that the machine should be destroyed. From March, 1909, until June, 1914, I had spent all my spare time building and flying various models, in all some 25 monoplanes and half-a-dozen machines of other designs, all tractors. Although still a model enthusiast, on leaving our former home, and losing my workshop and flying ground in consequence, something had to be done with the various "relics." Having packed up the two which were in flying order and also two others, I decided to burn the remainder, much to my chagrin. The two photographs show the funeral procession and the beginning of the end.

Aeromodellists Serving With the Colours.

Mr. J. Rice-Skinner (hon. sec. Twickenham and District Model Aero Club) sends us the following lists of members now serving with the Colours:—

The Twickenham and District Aero Club's Roll of Honour.

H. Stagg	...	Queen's Westminsters.
A. Jacker	...	Queen's Westminsters.
R. Hill	...	Queen's Westminsters.
S. Bremner	...	1st Surrey Rifles.
H. Clayton	...	R.N.A.S.
H. Digby	...	Regiment not known.
Maughan-Ferry	...	Special Constable.



GYROSTATIC CONTROLS FOR TORPEDOES, SUBMARINES, AIRSHIPS AND AEROPLANES.

A PAPER dealing with the application of gyrostatic devices to the control of moving bodies, particularly in regard to such cases where the stability of the gyrostatic system is derived from the propelling system was read recently by Dr. J. G. Gray before the Institution of Engineers and Shipbuilders in Scotland.

The author's remarks referred principally to the gyrostatic control of torpedoes, submarines, and motor cars; but in relation to aircraft, he observed that a gyrostat mounted on an aeroplane so as to have two instabilities without rotation of its fly-wheel, and with its axis across the aeroplane, could be endowed with complete stability by causing it to steer the aeroplane. A gyrostat so mounted would be available for operating the balancing flaps. Again, the axis of the gyrostat could be placed fore and aft, and the gyrostat would then be available for operating the elevator. In order that a gyrostat may be used to operate both the balancers and the elevator of an aeroplane, it must be mounted on the aeroplane with its axis vertical. To obtain stability of the gyrostat it should be provided with two instabilities without rotation of its fly-wheel, and caused to operate the elevators of the aeroplane. It could thus be completely stabilised, and would then be available for operating both sets of controls.

Objections had been taken to the use of gyrostats on aeroplanes, and he said it was certainly true that there was no point in utilising gyrostatic action in cases where the desired results could be obtained equally well without the application of such action. But the author was convinced that it is possible to contrive gyrostatic controls for aeroplanes which would be perfect in action, and the utility of such aeroplanes would be appreciated at the present time. Aeroplanes and airships, capable of being steered by means of electrical action transmitted from a fixed or moving station would certainly be of value to this country at the present time. Such contrivances would provide a method of fighting Zeppelins and of bombarding an enemy's lines and fortifications. In the subsequent discussion Professor Andrew Gray said that he was not sure that it was made perfectly clear that airships and aeroplanes could be steered without an aviator on the machine. They could be steered from any place of observation, and without any trailing wires at all, so that it was possible to send a torpedo to its destination by any desired path, however circuitous, without any risk of loss of life to the attacking party.

Blackburn Developments.

HAVING now completed their plant at Olympia, Leeds, the Blackburn Aeroplane and Motor Co., Ltd., are, we learn, now particularly well equipped for producing steel stampings, sheet metal blankings, cowls, tanks, strainers and eyebolts. They are also in a position to give quick delivery of all kinds of aeroplane parts, especially in repetition fittings.



ENEMY PATENTS RELATING TO AERONAUTICS.

THE following list of British patents which have been granted in favour of residents of Germany, Austria, or Hungary, is furnished in view of the new Patents Acts, which empower the Board of Trade to grant licences under certain conditions to British subjects to manufacture under enemy patents, and is specially compiled for FLIGHT, by Lewis Wm. Gould, Chartered Patent Agent, Enrolled Patent Attorney in the United States, 5, Corporation Street, Birmingham. It is desirable in the first instance to obtain a full copy of the patent specification (price 6d. each patent), and also the latest particulars upon the Patents Register. If any patent listed has been assigned to a non-enemy proprietor, the law does not apply.

No. 3110/12. Aerial machines without aerostats; propelling; planes, construction of. The machine is fitted by arranging around a central vertical driving-shaft a series of propellers of the type in which two hoops rotating in vertical planes and arranged at an angle to each other are connected by strips of fabric which are opened out and collapsed during the rotation. Schultze, K., Berlin.

No. 4292/12. Framework. The reinforced wooden girders of airship frames are strengthened by ribbed transverse stay-plates or webs. Schutte, J., Germany.

No. 5976/12. Aerial machines adapted to travel also on land or water; cars. A flying-machine is provided with a boat body of rectangular cross-section with a vertical fin to prevent rolling. The body is made of aluminium. Land-wheels are connected to the body so that when on land the tail is raised. The main plane is adjustable about a transverse axis, and can be locked in position, and the propeller is raised so as to clear the water when the machine is driven thereon. Gossman, O., Germany.

No. 7711/12. Air-ship sheds. A hangar formed of telescopic masts and canvas covering is packed in transport wagons, each of which is provided with two or more drums on which the canvas is wound, four drums on each side, for wire-stay ropes, and seats for receiving the masts. Scherrer, F., Germany.



NEW COMPANY REGISTERED.

Aircraft Accessories Co., Ltd.—Capital £1,000, in £1 shares (500 pref.). Acquiring the business of manufacturers, designers, dealers, &c., in aeroplanes, airships, seaplanes, and motors and accessories therefor, &c., carried on by A. F. Harris and N. A. Feary at 145, Ewell Road, Surbiton, as the Scientific Model Co. First directors, A. F. Harris and N. A. Feary.



Aeronautical Patents Published.

Applied for in 1913.

Published January 14th, 1915.

29,296. J. T. MILES. Airships to elevate and descend with safety.

Published January 21st, 1915.

22,557. A. A. D. LANG. Aerial propellers.

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